

Claims

- 1 A display controller for use with an  
electroluminescent display, the controller being  
5 arranged to vary the relative phase of signals applied  
to illuminated segment(s) of the display whereby the  
brightness of the segment(s) can be varied.
2. A display controller as claimed in claim 1, wherein  
10 the controller controls the phase of the signals on a  
cycle-by-cycle basis such that it applies drive signals  
to the or each segment which are either in phase or in  
anti-phase with a common signal applied to that segment,  
whereby the proportion of the signals that are in anti-  
15 phase determines the brightness of the segment.
3. A display controller as claimed in claim 1, wherein  
the controller controls the phase of the signals such  
that a drive signal applied to the or each segment  
20 always has an identical waveform to a common signal  
applied to that segment, but the waveforms of the drive  
and common signals are selectively relatively phase-  
shifted by a variable number of degrees in order to  
determine the brightness of the segment  
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4. A display controller as claimed in claim 1, 2 or 3,  
wherein there are provided at least sixteen levels of  
brightness
- 30 5. A display controller as claimed in claim 1, 2 or 3,  
wherein there are provided at least thirty-two levels of  
brightness.
- 35 6. A display controller as claimed in any preceding  
claim arranged to provide separate control of the phase  
of a plurality of signals for controlling a  
corresponding plurality of segments of a multi-segment

display.

7. A display controller as claimed in any preceding claim, wherein the controller provides a pattern of ON  
5 and OFF signals for each level of brightness that minimises clustering of "ON" drive signals.

8. A display controller as claimed in claim 7 comprising a look-up table which provides a pattern of "ON" drive  
10 signals that minimises clustering for each given level of brightness.

9. A display controller as claimed in claim 8, further comprising a cycle state counter connected to the look-up  
15 up table, the look-up table in turn being connected to memory containing segment data.

10. A display controller as claimed in any preceding claim, the controller being arranged to illuminate a plurality of different segments simultaneously such that the segments are driven using drive signal patterns that are substantially out of phase with each other.

11. A controller for use with a multi-segment  
25 electroluminescent display, the controller providing an alternating voltage common output and a plurality of alternating voltage drive outputs for the segments, wherein, during each cycle, the controller causes the drive outputs to be either in phase or in anti-phase  
30 with the common output such that the brightness of the segments may be controlled.

12. A controller as claimed in any preceding claim, wherein the controller comprises a control unit that  
35 provides control signals to a plurality of switches, the switches each controlling a drive voltage for a segment.

13. A controller as claimed in claim 12 wherein said control signals control a plurality of half H-bridges, the terminals of the half H-bridges being connected respectively to ground and to a high voltage DC supply, whereby the half H-bridges provide an AC drive voltage.

14. A controller as claimed in claim 13, wherein one of said half H-bridges provides a common signal and the remaining H-bridges provide drive signals.

15. An electroluminescent display in combination with a controller as claimed in any preceding claim.

16. A method of controlling an electroluminescent display comprising varying the relative phase of the drive and common signals applied to the illuminated segment(s) of the display whereby the brightness of the segment(s) can be varied.

17. A method of controlling an electroluminescent display as claimed in claim 16, comprising the use of a controller as claimed in any of claims 1 to 15.